

# PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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## COMPLETE SPECIFICATION.

### Improvements in or relating to Building Panels.

We, BUILDING PRODUCTS OF CANADA LIMITED, a company organized under the laws of Canada, of Post Office Box 6063, Montreal, Quebec, Canada, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to siding panels for buildings and more particularly, to siding panels having plastic coverings.

Siding panels which are covered with a sheet of plastic material have many advantages over the wooden sliding commonly used for the exterior walls of buildings since plastic covering materials are available which are water-proof, do not absorb moisture, and are highly resistant to fire. More-over, the plastic coverings may be permanently coloured, thus obviating the need for painting or other resurfacing. On the other hand, plastic coverings for sidings, when the panels are of substantial length, have been found to suffer from a defect known in the building trade as "oil canning". This phenomenon appears to be the result of thin gauge material undergoing temperature change while restrained about its perimeter. The characterizing features of "oil canning" are raised waves in the sheet of materials, the waves being of about 2" in width and occurring at spaced intervals of one foot or so along the length of the panel. These deformations or waves in the surface of the sheeting may not appear until the covered panels have been exposed to weathering for some time and initially some of the waves or deformations will disappear in cooler weather. However, in time a number of them will become permanent.

While this "oil canning" phenomenon is

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structurally harmless, it detracts from the appearance of the covered building siding panels, and the resulting appearance is so objectionable that a number of plastic covered panels which were, in recent years, launched in the building materials market have been withdrawn from the market because of complaints received from the trade. "Oil canning" is not a serious problem where the panels which are covered with the plastic material are of a short length, but there is at present in the building trade an unsatisfied demand for plastic covered building panel which can be used in lengths of, say, three or more feet, yet their covers will be free of "oil canning".

We have made the surprising discovery that a building panel comprising a rectangular base sheet formed of a foamed thermosetting cross-linked synthetic resin, such as foamed polyurethane, and a rectangular exterior sheet of rigid polyvinyl chloride bonded to one face of said rectangular sheet of foamed plastic material, can be utilized in sheets of considerable length, i.e. three or more feet, yet will be free of "oil canning". This enables us to employ panels which are of appreciably greater length than width.

The rectangular exterior sheet of rigid polyvinyl chloride preferably is provided with top and bottom inwardly extending lips or flanges which extend the full length of the panel and form the top and bottom edges thereof, and the bond between the foamed base sheet and the polyvinyl chloride exterior sheet is preferably created by forming the foamed plastic sheet in place with respect to the polyvinyl chloride sheet by a conventional foaming, pouring or spraying operation.

We have found that the building panels

of our invention are not only desirable in that they are resistant to "oil canning" but also because they are light in weight yet of high strength, thereby lending themselves to utilization in long lengths. This leads not only to economy in erection but also to improved appearance in the resulting wall structure due to the reduction in the number of vertical joints in walls covered with the panels of the invention.

Furthermore, the panels of the invention have been found to have good fire-resisting qualities, especially when the base sheet is formed of foamed polyurethane.

Finally, the panels of the invention are valuable because they are shock absorbent, doubtless due to the presence of the foamed plastic, and have been noted to resist dimpling much better than, for example, a similar polyvinyl chloride sheet bonded to a fibre-board base sheet.

In the attached drawing which illustrates one embodiment of the invention:

Figure 1 is a perspective view showing a portion of a panel according to the invention, and

Figure 2 is a vertical section of a portion of a wall structure showing the manner in which the panels are used in the erection of a wall structure.

The preferred form of the invention illustrated in Figure 1 essentially comprises a rectangular exterior sheet of polyvinyl chloride 10 bonded to a rectangular base sheet 11 of foamed polyurethane. The latter may be backed with a sheet 12 of kraft paper or asbestos paper. In the illustrated preferred panel, the sheet 10 has an upper flange 13 and a lower flange 14, the flanges extending inwardly and forming the upper and lower longitudinal edges of the panel; and the bond between the base sheet 11 and the polyvinyl chloride sheet 10 is achieved by forming the sheet 11 in place by a conventional foaming, pouring or spraying operation.

In the embodiment of the invention listed in Figure 1, there is provided, parallel and near to the top edge of the panel, a trapezoidal locking recess 15 which extends the full length of the exterior sheet 10. A lip 16 projects vertically upwards from the lower horizontal edge of the trapezoidal recess 15 in the plane of the front face of the sheet 10. The lip 16 projects upwards to within a short distance of the upper horizontal edge of the recess 15 to provide a longitudinal entrance slot 17. The top edge of the lip 16 is projected rearwardly at 18 to reinforce the lip 16 and provide a locking shoulder. The inner edge of each flange 14 is provided with a spring locking member 19. The spring locking member 19 is intended to lockingly co-operate with the locking recess 15 in the next lowermost

panel in a wall structure provided with the siding panels of the invention. The nature of this locking arrangement is not being described in any detail since it is fully disclosed in the present assignee's Canadian Patent No. 664,948 of June 11, 1963 (L. J. Newton et al). Furthermore, the use of this particular locking arrangement is by no means essential to the invention.

Other known means for locking the panels to one another could be employed and, as a matter of fact, instead of using locking devices forming parts of the panels themselves, the panels could be fastened in place by attaching conventional clips to the studding, etc. of the wall structure.

The panels are preferably provided near their top edges with a series of slots 20, the slots being located at spaced points along the length of the exterior sheet 10, to facilitate nailing of the siding panel to a wall structure without the nails puncturing the exterior sheet 10.

The manner in which siding panels such as those shown in figure 1, would be employed in creating a wall structure, is shown in figure 2, wherein 21 indicates one of the conventional studs of the framework of the wall. A first course of panels is applied and secured by nails 22 which pass through the nailing slots 20. The second course of panels is then applied as follows. The panels of the second course are held in a generally horizontal position and their locking members 19 are then pushed through the slots 17 into the trapezoidal shaped recesses 15 in the first course of panels, whereupon the panels of the second course are pushed upwards and towards the studding 21, whereupon they are nailed in place with the aid of nails 23.

Walls raised in the manner shown and utilizing the panel sidings of the invention have been found to be virtually free from "oil canning" after exposure to extremes of weather over considerable periods of time. While we do not know exactly why this beneficial effect is obtained, we suspect that the undesirable phenomenon is avoided because the polyvinyl chloride sheet 10, when subjected to temperature changes, remains bonded to the foamed plastic material and is forced to flow within itself to counteract the resisting force established by the bonding to the rigid substrate, i.e. the foamed plastic material 11.

It is preferred to make the sheet 11 of foamed polyurethane because of its superior insulating and fire-resisting characteristics.

#### WHAT WE CLAIM IS:—

1. A rectangular building siding panel comprising a base sheet formed from a foamed thermosetting cross-linked synthetic resin and a smooth exterior sheet of rigid

polyvinyl chloride bonded thereto to form an exterior surface.

2. A building siding panel as claimed in claim 1, wherein said foamed synthetic resin is foamed polyurethane.

3. A building siding panel as claimed in claim 1 or claim 2, wherein said sheet of foamed synthetic resin has bonded to it, on the face thereof, opposite said sheet of rigid polyvinyl chloride, a sheet of paper.

4. A building siding panel as claimed in claim 1 or claim 2 wherein said sheet of foamed synthetic resin has bonded to it, on the face thereof opposite said sheet of rigid

polyvinyl chloride, a sheet of kraft paper or asbestos paper.

5. A building siding panel substantially as described in the foregoing specification and illustrated in the accompanying drawings.

**BUILDING PRODUCTS OF CANADA  
LIMITED.**

Per: BOULT, WADE & TENNANT,  
112, Hatton Garden,  
London, E.C.1.  
Chartered Patent Agents.

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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of  
the Original on a reduced scale

